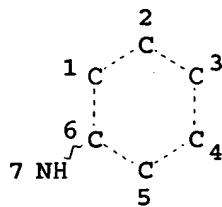


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FILE 'REGISTRY' ENTERED AT 18:24:30 ON 20 MAR 2007  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
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=> d his nofile

(FILE 'HOME' ENTERED AT 17:46:01 ON 20 MAR 2007)  
  
FILE 'HCAPLUS' ENTERED AT 17:46:18 ON 20 MAR 2007  
L1 1 SEA US2004110062/PN  
  
FILE 'REGISTRY' ENTERED AT 17:46:51 ON 20 MAR 2007  
L2 1 SEA 31545-82-1/BI  
  
FILE 'LREGISTRY' ENTERED AT 17:51:42 ON 20 MAR 2007  
L3 STR  
L4 SCR 2043  
  
FILE 'REGISTRY' ENTERED AT 17:52:42 ON 20 MAR 2007  
L5 50 SEA SSS SAM L3 AND L4  
L6 104572 SEA SSS FUL L3 AND L4  
SAV TEMP L6 YUA672/A  
  
FILE 'LREGISTRY' ENTERED AT 17:54:41 ON 20 MAR 2007  
L7 STR L3  
L8 STR L3  
  
FILE 'REGISTRY' ENTERED AT 17:56:05 ON 20 MAR 2007  
L9 50 SEA SUB=L6 SSS SAM (L7 OR L8)  
L10 9493 SEA SUB=L6 SSS FUL (L7 OR L8)  
SAV L10 TEMP YUA672S1/A  
L11 1 SEA L2 AND L10  
L12 1475 SEA L10 AND NC<2  
L13 6923 SEA L10 AND ?BIPHENYL?/CNS  
  
FILE 'HCAPLUS' ENTERED AT 18:14:45 ON 20 MAR 2007  
L14 6 SEA L11  
L15 2335 SEA L13 (L) DEV+ALL/RL  
L16 420 SEA L13/D  
L17 QUE ELECTROD##  
L18 QUE BATTERY OR BATTERIES  
L19 QUE DOPE# OR DOPING# OR DOPANT#  
L20 190 SEA (L15 OR L16) AND (L17 OR L18 OR L19)  
L21 102 SEA L20 AND (1907-1999)/PY,PRY,AY  
L22 63 SEA L21 AND (L17 OR L18)  
L23 20 SEA L13 (L) L18  
L24 15 SEA L23 AND (1907-1999)/PY,PRY,AY  
L25 5 SEA L14 NOT L24  
L26 50 SEA L22 NOT (L24 OR L25)

=> d que stat 110  
L3 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

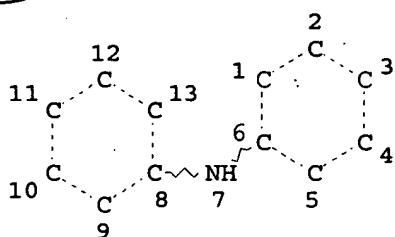
RSPEC I

NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE

L4 SCR 2043

L6 104572 SEA FILE=REGISTRY SSS FUL L3 AND L4  
STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

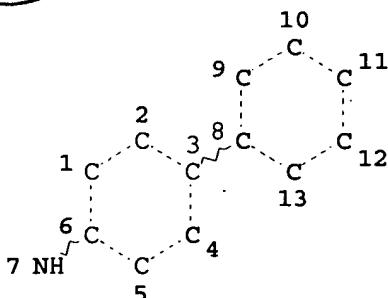
GRAPH ATTRIBUTES:

RSPEC I

NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE

L8 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RSPEC I

NUMBER OF NODES IS 13

## STEREO ATTRIBUTES: NONE

L10 9493 SEA FILE=REGISTRY SUB=L6 SSS FUL (L7 OR L8)

100.0% PROCESSED 16591 ITERATIONS

9493 ANSWERS

SEARCH TIME: 00.00.01

=&gt; fil hcap

FILE 'HCAPLUS' ENTERED AT 18:24:48 ON 20 MAR 2007

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

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=&gt; d l24 ibib abs hitstr hitind 1-15

L24 ANSWER 1 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:705482 HCAPLUS

DOCUMENT NUMBER: 133:298753

TITLE: Electrodes and batteries

INVENTOR(S): Harada, Manabu; Nishiyama, Toshihiko; Fujiwara, Masaki; Okada, Shinako; Kuroasaki, Masato

PATENT ASSIGNEE(S): Nec Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

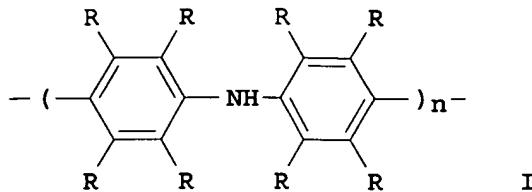
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

*✓ current  
application*

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000277118	A	20001006	JP 1999-76573	199903 19
JP 3183280	B2	20010709	<--	
US 2004110062	A1	20040610	US 2003-716672	200311 20
PRIORITY APPLN. INFO.:			JP 1999-76573	A 199903 19
			<--	
			US 2000-528711	A1 200003 20

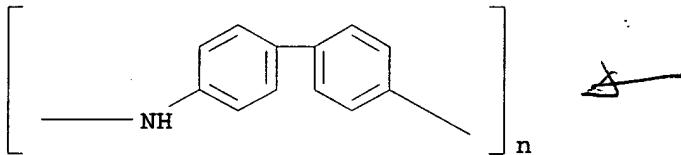
GI



AB The electrodes use active mass containing polybiphenylaniline derivs. The derivs. are I, where R = H, halogen, OH, carboxy, sulfone, sulfuric acid, nitro, cyano, alkyl, aryl, alkoxy, aryloxy, amino, alkylthio, arylthio, or heterocyclic groups and may be different from each other. The batteries use the above electrodes as cathodes.

IT 31545-82-1D, Poly(imino[1,1'-biphenyl]-4,4'-diyl), derivs.  
RL: DEV (Device component use); USES (Uses)  
(cathodes from polybiphenylaniline derivs. for batteries  
)

RN 31545-82-1 HCAPLUS  
CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



IC ICM H01M004-60  
ICS H01M004-02; H01M010-36  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT 31545-82-1D, Poly(imino[1,1'-biphenyl]-4,4'-diyl), derivs.  
RL: DEV (Device component use); USES (Uses)  
(cathodes from polybiphenylaniline derivs. for batteries  
)

L24 ANSWER 2 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STM  
 ACCESSION NUMBER: 1994:513296 HCAPLUS  
 DOCUMENT NUMBER: 121:113296  
 TITLE: Secondary batteries with improved cathodes  
 INVENTOR(S): Kimura, Okitoshi; Fujii, Toshishige  
 PATENT ASSIGNEE(S): Ricoh Kk, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
JP 06052859	A	19940225	JP 1992-223489	199207 30

&lt;--

JP 3344736  
PRIORITY APPLN. INFO.:

B2 20021118

JP 1992-223489

199207  
30

&lt;--

AB The batteries use cathode active mass containing a material redox-able at 3.0-4.0 V vs. Li/Li<sup>+</sup> in a nonaq. electrolyte and a spinel type LixMn<sub>2</sub>O<sub>4</sub>, whose composition changes from 0 ≤ x < 1 to 1 ≤ x < 2 during the electrochem. reaction of the cathodes.

IT 108443-85-2

RL: USES (Uses)

(cathodes containing spinel type lithium manganese oxide and, for secondary batteries)

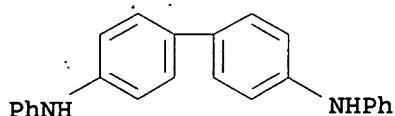
RN 108443-85-2 HCPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 531-91-9

CMF C24 H20 N2



IC ICM H01M004-50  
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 108443-85-2

RL: USES (Uses)

(cathodes containing spinel type lithium manganese oxide and, for secondary batteries)

L24 ANSWER 3 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1994:439175 HCPLUS

DOCUMENT NUMBER: 121:39175

TITLE: Lead acid batteries with conducting polymer coated electrodes

INVENTOR(S): Kondo, Shigeo; Takada, Kazunori

PATENT ASSIGNEE(S): Matsushita Electric Ind Co Ltd, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
JP 06076821	A	19940318	JP 1992-228150	199208 27

&lt;--

PRIORITY APPLN. INFO.:

JP 1992-228150

199208

27

&lt;--

AB The batteries have PbO<sub>2</sub> based cathodes and Pb based anodes with the cathodes and/or anodes composed of active mass particles, where at least part of the particles are coated with a conducting polymer. These batteries have improved charging efficiency and long cycle life.

IT 117051-73-7, Polydiphenylbenzidine

RL: USES (Uses)

(lead electrodes containing active mass particles coated with, for acid batteries)

RN 117051-73-7 HCPLUS

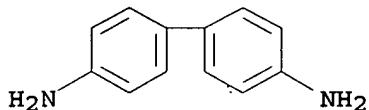
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H<sub>2</sub>O N<sub>2</sub>

CCI IDS



2 (D1- Ph )

IC ICM H01M004-57

ICS B22F001-02; H01M004-14

ICA C25D013-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 492-97-7, 2,2'-Bithiophene 1081-34-1, 2,2':5',2''-Terthiophene 25233-30-1, Polyaniline 25233-34-5, Polythiophene 30604-81-0, Polypyrrole 82451-56-7, Polyazulene 84928-92-7, Poly(3-methyl thiophene) 117051-73-7, Polydiphenylbenzidine

RL: USES (Uses)

(lead electrodes containing active mass particles coated with, for acid batteries)

L24 ANSWER 4 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1993:521304 HCPLUS

DOCUMENT NUMBER: 119:121304

TITLE: Cathodes and secondary batteries using the cathodes

INVENTOR(S): Fujii, Toshishige; Oosawa, Toshuki; Kimura, Okitoshi; Kahata, Toshuki; Nakajima, Shinichiro

PATENT ASSIGNEE(S): Ricoh Kk, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

KIND DATE

APPLICATION NO.

DATE

JP 05114399

A

19930507

JP 1991-301068

199110  
21

PRIORITY APPLN. INFO.:

JP 1991-301068

199110  
21

&lt;--

**AB** The cathodes consist of polymers, that can be electrochem. oxidized and reduced, and mixed oxides containing  $\geq 1$  alkali metals and transition metals, preferably Li Mg oxide or Li Co oxide, and have d. 0.6-0.2 g/cm<sup>2</sup>. The batteries using the cathodes show workability, capacity tolerance for overdischarging, and long cycle life.

**IT** 117051-73-7, Polydiphenylbenzidine

RL: USES (Uses)

(cathodes containing mixed metal oxide and, for batteries)

RN 117051-73-7 HCPLUS

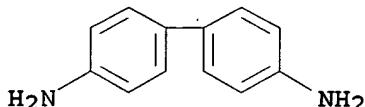
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H20 N2

CCI IDS



2 ( D1- Ph )

**IC** ICM H01M004-02  
ICS H01M010-40

**CC** 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

**IT** 25067-59-8 25233-30-1, Polyaniline 30604-81-0, Polypyrrole  
117051-73-7, Polydiphenylbenzidine

RL: USES (Uses)

(cathodes containing mixed metal oxide and, for batteries)

L24 ANSWER 5 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1991:85400 HCPLUS

DOCUMENT NUMBER: 114:85400

TITLE: Secondary polymer batteries

INVENTOR(S): Yoshino, Masaki; Yoneyama, Sachiko; Kimura, Okitoshi; Osawa, Toshiyuki; Kahata, Toshiyuki

PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02250273	A	19901008	JP 1989-69303	198903 23
JP 2934449	B2	19990816		<--
US 5037713	A	19910806	US 1990-495144	199003 19
PRIORITY APPLN. INFO.: JP 1989-69303 A				<-- 198903 23

AB The batteries have electrolyte of  $\geq$ 3M solute in solvent mixts. of  $\gamma$ -butyrolactone and ethylene glycol alkyl ethers (20-80 mol.% based on the lactone). The batteries have a high energy d. Thus, a Li-polyaniline battery having a 3.5M LiBF<sub>4</sub>/50:50 (mol.)  $\gamma$ -butyrolactone-ethylene glycol methylethyl ether electrolyte was cycled and showed energy d. of 144 mA-h/g at 20th and 150th cycle.

IT 117051-73-7, Poly(diphenylbenzidine)

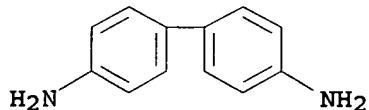
RL: USES (Uses)  
 (cathodes, in batteries with organic electrolytes with  
 $\gamma$ -butyrolactone and ethylene glycol alkyl ether solvents)

RN 117051-73-7 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8  
 CMF C24 H20 N2  
 CCI IDS



2 (D1-Ph)

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 IT 25233-30-1, Polyaniline 30604-81-0, Polypyrrole  
 117051-73-7, Poly(diphenylbenzidine)  
 RL: USES (Uses)  
 (cathodes, in batteries with organic electrolytes with  
 $\gamma$ -butyrolactone and ethylene glycol alkyl ether solvents)

L24 ANSWER 6 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1990:615370 HCPLUS  
 DOCUMENT NUMBER: 113:215370  
 TITLE: Secondary nonaqueous batteries  
 INVENTOR(S): Osawa, Toshiyuki; Kimura, Okitoshi; Kahata,  
 Toshiyuki; Yoneyama, Sachiko  
 PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02177270	A	19900710	JP 1988-329249	198812 28
<-- PRIORITY APPLN. INFO.: JP 1988-329249 198812 28				

AB The batteries have conductive polymer cathodes and electrolytes containing mainly SbF<sub>6</sub><sup>-</sup> anions and solvent mixts. of carbonate esters and lactones and/or ethers. The battery anodes are preferably alloys of Li with polyvalent metals. The batteries have high capacity and long cycle life. Thus, a polypyrrole/Li-Mg alloy battery having 1.5M LiSbF<sub>6</sub>/3:7 DME-propylene carbonate electrolyte had energy d. 105 mA-h/g, cycle life ≥500 cycles, charge-discharge efficiency 93%, and open-circuit voltage 3.0 V.

IT 117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)  
 (cathodes, for batteries with electrolytes containing hexafluoroantimonate and mixed solvents)

RN 117051-73-7 HCPLUS

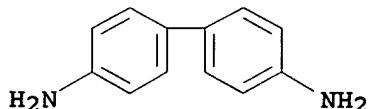
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H20 N2

CCI IDS



2 (D1-Ph)

IC ICM H01M010-40  
 ICS H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 25233-30-1, Polyaniline 30604-81-0, Polypyrrole  
 117051-73-7, Poly(diphenylbenzidine)  
 RL: USES (Uses)  
 (cathodes, for batteries with electrolytes containing hexafluoroantimonate and mixed solvents)

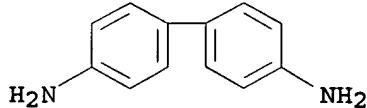
L24 ANSWER 7 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1990:142710 HCAPLUS  
 DOCUMENT NUMBER: 112:142710  
 TITLE: Characteristics of secondary batteries using conducting polymers prepared by electrochemical polymerization  
 AUTHOR(S): Kabata, T.; Kimura, O.; Yoneyama, S.; Ohsawa, T.  
 CORPORATE SOURCE: Res. Dev. Cent., Ricoh Co., Ltd., Yokohama, 223, Japan  
 SOURCE: Progress in Batteries & Solar Cells (1989), 8, 191-4  
 CODEN: PBASDR; ISSN: 0198-7259  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB A Li/polyaniline battery had a nominal capacity of 200 mA-h, a total weight of 17 g, an open-circuit voltage of 3.7 V, a short-circuit current of 1.5 A, and a coulombic efficiency of 100% (at 150 mA-h/g discharge). The voltage of the battery increased to 4.1 V on charging and further charging, above 180 mA-h/g, raised the voltage to 5.2 V. A Li/poly(diphenylbenzidine) battery had a coulombic efficiency of 100% at <100 mA-h/g discharge capacity and a cut-off charge voltage of 4.0 V; the voltage of the battery increased continuously during charging.

IT 117051-73-7, Poly(diphenylbenzidine)  
 RL: USES (Uses)  
 (cathodes, lithium battery with, cycling capacity and stability of)  
 RN 117051-73-7 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8  
 CMF C24 H20 N2  
 CCI IDS



2 (D1-Ph)

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38, 72  
 IT 25233-30-1, Polyaniline 117051-73-7,  
 Poly(diphenylbenzidine)  
 RL: USES (Uses)

(cathodes, lithium battery with, cycling capacity and stability of)

L24 ANSWER 8 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1989:481389 HCAPLUS  
 DOCUMENT NUMBER: 111:81389  
 TITLE: Anode for secondary battery  
 INVENTOR(S): Ohsawa, Toshiyuki; Kabata, Toshiyuki; Kimura, Okitoshi; Yoneyama, Sachiko  
 PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan  
 SOURCE: Ger. Offen., 15 pp.  
 CODEN: GWXXBX  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3838329	A1	19890524	DE 1988-3838329	198811 11
DE 3838329	C2	19910124		<--
JP 02030060	A	19900131	JP 1988-282376	198811 10
US 5162178	A	19921110	US 1990-632140	199012 21
PRIORITY APPLN. INFO.:			JP 1987-283096	A 198711 11
			JP 1987-283097	A 198711 11
			JP 1988-28923	A 198802 12
			JP 1988-95680	198804 20
			US 1990-483267	B2 199002 16

AB The anode, of a battery with an active polymer cathode, comprises a current collector of enlarged surface area and covered with an alkali metal (Li or Li alloy) layer, an ion-conductive polymer layer containing dispersed alkali metal, an alkali metal layer and an ion-conductive polymer layer, or an ion-conductive polymer layer and an alkali metal layer. The active polymer includes polypyrrole, polyaniline, polyazulene, polycarbazole, poly(diphenylbenzidine),

and polypyridine. The Al or Al alloy current collector is perforated or in laminar form, the surface area of all bores of the perforated collector is 40-75% of the total collector surface area. Several invention anodes with Li layers as well as with Li and polymer layers were prepared and excellent performances of organic-electrolyte batteries using these anodes were demonstrated.

IT 117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, in organic-electrolyte batteries with lithium anodes having grids of enlarged surface area)

RN 117051-73-7 HCPLUS

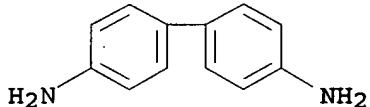
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H20 N2

CCI IDS



2 ( D1- Ph )

IC ICM H01M004-60

ICS C08L079-02; C08L079-04; C08L065-00; B32B027-06; B32B007-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

IT 25013-01-8, Polypyridine 25233-30-1, Polyaniline 30604-81-0,  
Polypyrrole 51555-21-6, Polycarbazole 82451-56-7, Polyazulene  
117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, in organic-electrolyte batteries with lithium anodes having grids of enlarged surface area)

L24 ANSWER 9 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1989:157688 HCPLUS

DOCUMENT NUMBER: 110:157688

TITLE: Battery with polymer cathode

INVENTOR(S): Osawa, Toshiyuki; Kahata, Toshiyuki; Yoneyama, Sachiko; Kimura, Okitoshi

PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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-----	-----	-----	-----	-----
JP 63259965	A	19881027	JP 1987-93966	

198704  
16

PRIORITY APPLN. INFO.: JP 1987-93966

198704  
16

&lt;--

AB Porous amorphous C is used as current collectors for batteries using polymers as the cathode-active mass. Thus, polypyrrole was electropolymerized on an amorphous graphite pellet of 45% porosity from a propylene carbonate solution containing 0.2M pyrrole and 1M LiBF<sub>4</sub> at 10 V vs. a Ni counterelectrode. A secondary Li battery using this cathode had an open-circuit voltage of 3.5 V, an energy d. of 192 W-h/kg active mass, and an output power of 15 mW.

IT 117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, with current collectors of porous amorphous graphite, for batteries)

RN 117051-73-7 HCPLUS

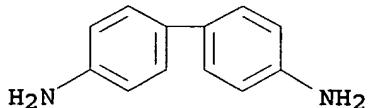
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H20 N2

CCI IDS



d  
1

2 (D1-Ph)

Ref

IC ICM H01M004-66  
ICS H01M004-02CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38IT 25233-30-1, Polyaniline 30604-81-0, Polypyrrole  
117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, with current collectors of porous amorphous graphite, for batteries)

L24 ANSWER 10 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1989:98856 HCPLUS

DOCUMENT NUMBER: 110:98856

TITLE: Sheet-type cathode, its manufacture and secondary battery

INVENTOR(S): Kabata, Toshiyuki; Ohsawa, Toshiyuki; Yoneyama, Sachiko; Kimura, Okitoshi

PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan

SOURCE: PCT Int. Appl., 52 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 8808210	A1	19881020	WO 1988-JP373	198804 14
<--				
W: DE, JP, US DE 3890245	T0	19890503	DE 1988-3890245	198804 14
<--				
DE 3890245 US 4999263	C2 A	19921210 19910312	US 1988-290411	198812 15
<--				
PRIORITY APPLN. INFO.:		JP 1987-92791	A	198704 15
<--				
		JP 1987-168280	A	198707 06
<--				
		JP 1987-169689	A	198707 09
<--				
		JP 1987-248093	A	198710 02
<--				
		JP 1987-283095	A	198711 11
<--				
		WO 1988-JP373	W	198804 14
<--				

AB A sheet-type cathode of an active mass of a polymer and a collector having a plurality of through holes is prepared by electropolymerization of a conducting polymer on both surfaces of the collector in H<sub>2</sub>SO<sub>4</sub> or sulfonic acids. Batteries are prepared by folding the invention cathode and an anode with a separator in between, with the electrode terminals located at opposing ends of the cathode and anode, and the batteries may use a solid electrolyte. The collector preferably has a roughened surface. Thus, 10-μm Ni foils was roughened by a sandpaper and punched with 200 holes (diameter 400 μm)/cm<sup>2</sup> to obtain collectors. A polypyrrole film was electropolymerized on the prepared collector from a 0.1M pyrrole solution containing 0.05M Na p-toluenesulfonate at 5 V, washed with MeCN and with Me<sub>2</sub>CO, and vacuum dried to obtain a cathode. A battery using this cathode, a Li anode with a surface-roughened Ni collector, and a 1M LiBF<sub>4</sub>/propylene carbonate electrolyte had an open-circuit voltage of

3.6 V, a short-circuit c.d. of 4.1 mA/cm<sup>2</sup>, energy d. 270 and 268 W-h/kg before and after 10 charge-discharge cycles, and a lifetime >100 cycles, vs. 3.6 V, 2.6 mA/cm<sup>2</sup>, 242 and 76 W-W/kg, and 29 cycles, resp., for a battery using a cathode collector with smoothed surface and without holes.

IT 117051-73-7, Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, with surface-roughened and punched collectors, for batteries)

RN 117051-73-7 HCPLUS

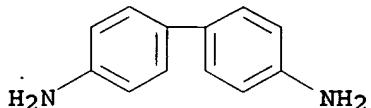
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H20 N2

CCI IDS



2 ( D1- Ph )

IC ICM H01M004-02

ICS H01M004-04; H01M004-60; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

IT 25233-30-1, Polyaniline 30604-81-0, Polypyrrole 84928-92-7,  
Poly(3-methyl thiophene) 117051-73-7,  
Poly(diphenylbenzidine)

RL: USES (Uses)

(cathodes, with surface-roughened and punched collectors, for batteries)

L24 ANSWER 11 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1988:573571 HCPLUS

DOCUMENT NUMBER: 109:173571

TITLE: Manufacture of semiconducting or conducting polymers and their use in batteries

INVENTOR(S): Kimura, Okitoshi; Osawa, Toshiyuki; Kabata, Toshiyuki; Nishihara, Hiroshi; Aramaki, Kunitsugu

PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan

SOURCE: Ger. Offen., 19 pp.

CODEN: GWXXBX

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

KIND

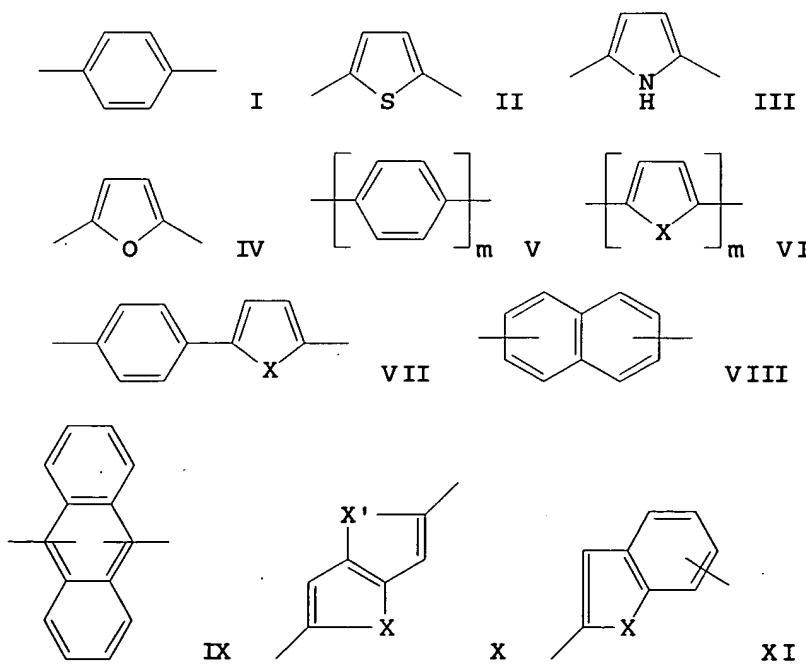
DATE

APPLICATION NO.

DATE

DE 3735971	A1	19880609	DE 1987-3735971	198710 23
			<--	
DE 3735971	C2	19901220		
JP 63199726	A	19880818	JP 1987-34036	198702 17
			<--	
JP 08002944	B	19960117		
JP 63225622	A	19880920	JP 1987-34037	198702 17
			<--	
JP 07121980	B	19951225		
US 4837096	A	19890606	US 1987-111727	198710 23
			<--	
PRIORITY APPLN. INFO.:				JP 1986-254393 A 198610 25
			<--	
			JP 1987-34036 A 198702 17	
			<--	
			JP 1987-34037 A 198702 17	
			<--	

GI



AB Polymer with structure units  $(AC.tpbond.C)_n$  or  $(ACX_1CX_2)_n$  in the main chain is obtained by electrochem. reduction of  $Z_1AZ_2$  in presence or absence of a metal carbonyl  $Fe(CO)_5$ ,  $Co(CO)_8$ ,  $Cr(CO)_6$ ,  $Mo(CO)_6$ ,  $V(CO)_6$ ,  $W(CO)_6$ ,  $Mn_2(CO)_6$ ,  $Ni(CO)_4$ ,  $Pt(CO)_4$ , or  $C_6H_6Cr(CO)_3$ . A is a linear aromatic conjugated group I, II, III, IV, V, VI, or VII or an aromatic group with condensed rings VIII, IX, X, or XI;  $n \geq 10$ ;  $X_1$  and  $X_2$  are H or halogen, m is an integer; X and X' are S, O, or NH; and  $Z_1$  and  $Z_2$  are halomethyl groups. The polymer is used as active material in organic secondary batteries and their cathodes. In an electrolytic cell with Cu electrodes, 47 mmol  $\alpha,\alpha,\alpha,\alpha',\alpha',\alpha'$ -hexabromo-p-xylene and n-Bu<sub>4</sub>NClO<sub>4</sub> were dissolved in propylene carbonate and electrochem. polymerized at -2 V (vs. Ag/Ag<sup>+</sup>) in Ar, and the obtained polymer was attached to Ni foils to prepare an anode and a cathode. A thin laminar battery using these electrodes, a 1M LiBF<sub>4</sub> in propylene carbonate electrolyte, and polypropylene fiber-fleece separator had open-circuit voltage of 1.4 V and theor. energy d. of 64 W-h/kg.

IT 117051-73-7P, Poly(diphenylbenzidine)

RL: PREP (Preparation)

(preparation of, by electropolymer. for battery electrodes)

RN 117051-73-7 HCPLUS

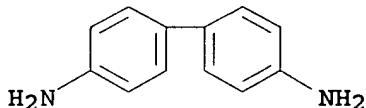
CN [1,1'-Biphenyl]-4,4'-diamine, diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 102217-61-8

CMF C24 H<sub>2</sub>O N<sub>2</sub>

CCI IDS



2 ( D1- Ph )

IC ICM C08F002-58

ICS C25B003-10; C08F138-00; H01M004-60; H01B001-06

ICA C07D307-36; C07D333-04; C07D333-08; C08F038-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38, 72, 76

IT 26715-74-2P 30604-81-0P, Polypyrrole 66837-56-7P 117001-52-2P  
117051-73-7P, Poly(diphenylbenzidine)

RL: PREP (Preparation)

(preparation of, by electropolymer. for battery electrodes)

L24 ANSWER 12 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1988:476667 HCPLUS

DOCUMENT NUMBER: 109:76667

TITLE: Batteries with polydiphenylbenzidine electrodes  
INVENTOR(S): Kahata, Toshuki; Suzuki, Tetsuo; Kojima, Akio;  
Yoshikawa, Masao; Oosawa, Toshuki

PATENT ASSIGNEE(S): Ricoh Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63108673	A	19880513	JP 1986-254394	198610 25
JP 07024221	B	19950315	JP 1986-254394	198610 25

AB Polydiphenylbenzidine is used as cathodes and/or anodes for batteries. Thus, diphenylbenzidine electropolymerd. at 3.0 V from a 4mM MeCN solution containing 0.1M Bu<sub>4</sub>NClO<sub>4</sub> and 0.05M lutidine. on a Nesa glass, pressed on a Ni foil to form a cathode. A Li battery using this cathode and a LiBF<sub>4</sub>/propylene carbonate electrolyte had an open-circuit voltage of 4.0 V 10 min after discharging, a power efficiency of 100%, an energy efficiency of 90%, and a theor. energy d. of 296 W-h/Kg, vs. 3.8 V, 84%, 71%, and 203 W-h/kg for a Li-polypyrrole battery. Batteries of the invention had lifetime of several tens charge-discharge cycles.

IT 108443-85-2

RL: USES (Uses)  
 (electrodes, for secondary batteries)

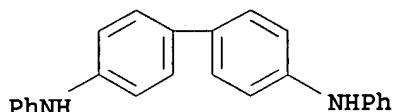
RN 108443-85-2 HCPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-diphenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 531-91-9

CMF C24 H20 N2



IC ICM H01M004-60

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 108443-85-2

RL: USES (Uses)  
 (electrodes, for secondary batteries)

L24 ANSWER 13 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1984:614065 HCPLUS

DOCUMENT NUMBER: 101:214065

TITLE: Nickel-cadmium battery

INVENTOR(S): Vyas, Brijesh

PATENT ASSIGNEE(S): AT and T Bell Laboratories, USA

SOURCE: U.S., 4 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4471038	A	19840911	US 1983-557615	198312 02
WO 8502497	A1	19850606	WO 1984-US1601	198410 09
<--				
W: JP				
RW: AT, BE, CH, DE, FR, GB, LU, NL, SE				
EP 163658	A1	19851211	EP 1984-903841	198410 09
<--				
R: BE, DE, FR, GB, NL				
JP 61500575	T	19860327	JP 1984-503828	198410 09
<--				
PRIORITY APPLN. INFO.:			US 1983-557615	A 198312 02
<--				
WO 1984-US1601				W 198410 09
<--				

AB Addition of polybenzimidazole (PBI) or related substances to alkaline Cd batteries increases the capacity and cycle life of Cd anodes in these batteries. Thus, performances of Cd anode-limited Ni-Cd batteries with 30% KOH electrolyte with and without PBI addition were determined. The capacity of the Cd anode with PBI remained higher on cycling than that of the Cd anode under the same conditions but without PBI.

IT 25928-81-8

RL: USES (Uses)

(electrolyte containing, nickel-cadmium battery alkaline, long cycle-life)

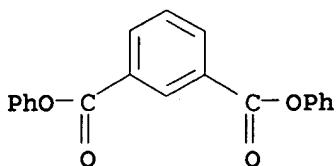
RN 25928-81-8 HCAPLUS

CN 1,3-Benzenedicarboxylic acid, diphenyl ester, polymer with [1,1'-biphenyl]-3,3',4,4'-tetramine (9CI) (CA INDEX NAME)

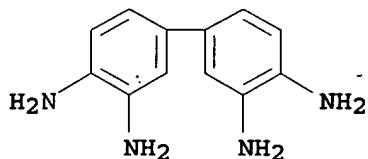
CM 1

CRN 744-45-6

CMF C20 H14 O4



CM 2

CRN 91-95-2  
CMF C12 H14 N4

IC H01M006-16  
 INCL 429198000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 IT 25734-65-0 25928-81-8  
 RL: USES (Uses)  
 (electrolyte containing, nickel-cadmium battery alkaline, long cycle-life)

L24 ANSWER 14 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1980:137534 HCPLUS  
 DOCUMENT NUMBER: 92:137534  
 TITLE: Diffusion measurements on a new battery separator membrane (polyphenylquinoxaline-cellulose acetate): a comparison with standard separator materials  
 AUTHOR(S): Kilroy, William P.; Laughlin, Linda  
 CORPORATE SOURCE: Electrochem. Branch, Nav. Surf. Weapons Cent., Silver Spring, MD, 20910, USA  
 SOURCE: Molecular Crystals and Liquid Crystals (1979), 54(3-4), 201-5  
 CODEN: MCLCA5; ISSN: 0026-8941  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB The title material (PPQ-CA) was fabricated into separators and its diffusion properties compared to known separator materials. Of most importance is the diffusion of the zincate ion through battery separators owing to the growth of Zn dendrites. The zincate diffusion was studied by differential pulse polarog. and the diffusion of OH- was studied by a pH change method developed earlier. A graph shows the rate of zincate diffusion for 3 different separator materials besides PPQ-CA including cellophane, Ag. cellophane, and sausage casing. The PPQ-CA offers the advantage of slower diffusion of zincate.

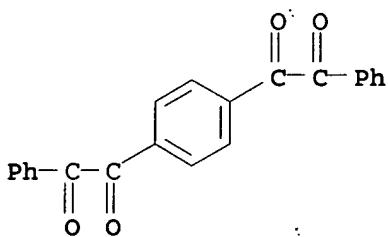
IT 25568-77-8  
 RL: PRP (Properties)

(battery separators from cellulose acetate and)

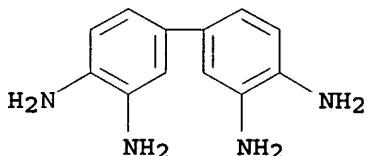
RN 25568-77-8 HCPLUS

CN Ethanedione, 1,1'-(1,4-phenylene)bis[2-phenyl-, polymer with  
[1,1'-biphenyl]-3,3',4,4'-tetramine (CA INDEX NAME)

CM 1

CRN 3363-97-1  
CMF C22 H14 O4

CM 2

CRN 91-95-2  
CMF C12 H14 N4

CC 72-2 (Electrochemistry)

Section cross-reference(s): 65

IT 91-19-0D, derivs., polymers 25568-77-8 52232-62-9

RL: PRP (Properties)

(battery separators from cellulose acetate and)

L24 ANSWER 15 OF 15 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1969:439900 HCPLUS

DOCUMENT NUMBER: 71:39900

TITLE: Substituted aliphatic polybenzimidazoles as membrane separator materials

AUTHOR(S): Trischler, Floyd D.; Levine, Harold H.

CORPORATE SOURCE: Narmco Res. and Develop. Div., Whittaker Corp., San Diego, CA, USA

SOURCE: Journal of Applied Polymer Science (1969), 13(1), 101-6

CODEN: JAPNAB; ISSN: 0021-8995

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Aliphatic polybenzimidazoles were modified to increase their hydrophilicity. The modified polymer can be used as a sterilizable battery separator in space vehicles. Poly(2,2'-octamethylene - 5,5'-bibenzimidazole) was sulfonated, N-hydroxyethylated with BrCH<sub>2</sub>CH<sub>2</sub>OH and NaH, and N-cyanoethylated and hydrolyzed to the

N-carboxyethyl derivative. The sulfonated polymer was too insol. for processing and the other derivs. had too great sp. resistance for use as battery separators. Carboxyethylated poly-(2,2'-hexamethylene - 5,5'-bibenzimidazole) had tensile strength 10,600 psi. and sp. resistance 90 ohm-cm., and met the requirements for a sterilizable battery separator.

IT 24979-92-8 26809-41-6

RL: USES (Uses)

(carboxyethylated, membranes from, as **battery**  
separators)

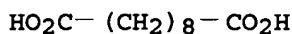
RN 24979-92-8 HCPLUS

CN Decanedioic acid, polymer with [1,1'-biphenyl]-3,3',4,4'-tetramine  
(9CI) (CA INDEX NAME)

CM 1

CRN 111-20-6

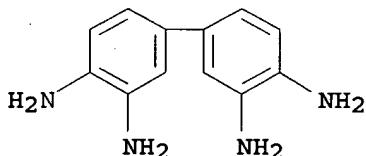
CMF C10 H18 O4



CM 2

CRN 91-95-2

CMF C12 H14 N4



RN 26809-41-6 HCPLUS

CN Octanedioic acid, polymer with [1,1'-biphenyl]-3,3',4,4'-tetramine  
(9CI) (CA INDEX NAME)

CM 1

CRN 505-48-6

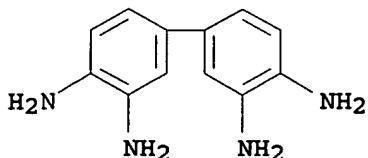
CMF C8 H14 O4



CM 2

CRN 91-95-2

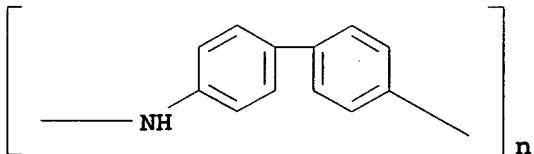
CMF C12 H14 N4



CC 37 (Plastics Fabrication and Uses)  
 IT 24979-92-8 25035-65-8 26809-41-6 26917-31-7  
 RL: USES (Uses)  
 (carboxyethylated, membranes from, as battery  
 separators)

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L25 ANSWER 1 OF 5 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2006:1183831 HCPLUS  
 DOCUMENT NUMBER: 146:101149  
 TITLE: Comparison of optical properties and doping behavior of -[(p-C<sub>6</sub>H<sub>4</sub>)<sub>m</sub>NH]<sub>n</sub> (m = 1-4) type polymers  
 AUTHOR(S): Horie, Masaki; Yamaguchi, Isao; Yamamoto, Takakazu  
 CORPORATE SOURCE: Chemical Resources Laboratory, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama, 226-8503, Japan  
 SOURCE: Chemistry Letters (2006), 35(10), 1110-1111  
 CODEN: CMLTAG; ISSN: 0366-7022  
 PUBLISHER: Chemical Society of Japan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Poly(p-oligophenylene amine)s, -[(p-C<sub>6</sub>H<sub>4</sub>)<sub>m</sub>NH]<sub>n</sub> (m = 2-4), receive electrochem. and chemical oxidation similar to polyaniline (m = 1). In the electrochem. oxidation (or p-doping) in aqueous media and acetonitrile, the oxidation of the polymer with m = 3 occurs at higher potentials by about 1.0 and 0.6 V, resp., compared with that of polyaniline.  
 IT 31545-82-1, Poly(imino[1,1'-biphenyl]-4,4'-diyl)  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (comparison of optical properties and doping behavior of polyamines containing from one to four phenylene groups in main chain)  
 RN 31545-82-1 HCPLUS  
 CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 36  
 IT 25233-30-1, Polyaniline 31545-82-1, Poly(imino[1,1'-

biphenyl]-4,4'-diyl) 178931-38-9

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(comparison of optical properties and doping behavior of polyamines containing from one to four phenylene groups in main chain)

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 2 OF 5 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:549051 HCPLUS

DOCUMENT NUMBER: 131:299882

TITLE: XRD data and isomorphous behavior of several bridged poly(p-phenylene)s including new poly(biphenylene)s

AUTHOR(S): Yamamoto, Takakazu; Kim, Sang-Bum; Choi, Byoung Ki

CORPORATE SOURCE: Research Laboratory of Resources Utilization, Tokyo Institute of Technology, Yokohama, 226-8503, Japan

SOURCE: Journal of Polymer Science, Part B: Polymer Physics (1999), 37(17), 2544-2547

CODEN: JPBPEM; ISSN: 0887-6266

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Several substituted polyphenylenes and polybiphenylenes having bridging units between the flat aromatic rings were synthesized by Friedel-Crafts, Grignard, and organometallic coupling techniques, and their crystal structures were examined by x-ray diffraction (XRD) for their packing modes. For  $(CH_2PhCH_2)_n$ -type compds. (prepared by Grignard coupling of  $ClMg-p-C_6H_4-MgCl$ ), the XRD peaks were considerably sharper than those of poly(p-xylylene), suggesting a larger crystal size or better-regulated chemical structure. Polybenzyl  $[(PhCH_2)_n]$  prepared by Grignard coupling (of 4-Cl-C<sub>6</sub>H<sub>4</sub>-Cl) had a high heads-tails regioregularity; this polymer has an observed d. of 1.26 g/cm<sup>3</sup>, which is in agreement with an orthorhombic cell with repeating unit of 5.2 Å. The XRD patterns of  $(4-C_6H_4-O-4-C_6H_4)_n$  and  $(4-C_6H_4-NH-4-C_6H_4)_n$  indicated a strong tendency of these compds. to take a similar packing mode (orthorhombic). This packing mode seems to hold for a wide range of bridged poly(p-phenylenes), including poly(p-biphenylenes).

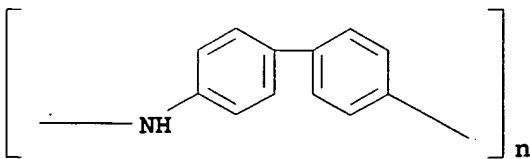
IT 31545-82-1P, Poly(imino[1,1'-biphenyl]-4,4'-diyl)

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(x-ray diffraction and isomorphism of packing mode of bridged poly(p-phenylenes) and poly(biphenylenes))

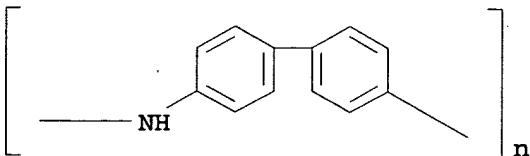
RN 31545-82-1 HCPLUS

CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



CC 36-2 (Physical Properties of Synthetic High Polymers)  
 Section cross-reference(s): 25, 75  
 IT 25722-33-2P, Poly(1,4-phenylene-1,2-ethanediyl) 27880-39-3P,  
 Poly(1,4-phenylenemethylene) 28212-28-4P, Poly(oxy[1,1'-biphenyl]-  
 3,3'-diyl) 31545-82-1P, Poly(imino[1,1'-biphenyl]-4,4'-  
 diyl)  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (x-ray diffraction and isomorphism of packing mode of bridged  
 poly(p-phenylenes) and poly(biphenylenes))  
 REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L25 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1999:216677 HCAPLUS  
 DOCUMENT NUMBER: 130:317943  
 TITLE: Redox behavior of poly(diphenylamine-4,4'-diyl)  
 in acidic aqueous media and electronic  
 properties of the doped polymer  
 AUTHOR(S): Yamamoto, Takakazu; Kim, Sang-Bum; Horie, Masaki  
 CORPORATE SOURCE: Research Laboratory of Resources Utilization,  
 Tokyo Institute of Technology, Yokohama,  
 226-8503, Japan  
 SOURCE: Japanese Journal of Applied Physics, Part 2:  
 Letters (1999), 38(3A), L273-L276  
 CODEN: JAPLD8; ISSN: 0021-4922  
 PUBLISHER: Japanese Journal of Applied Physics  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Poly(diphenylamine-4,4'-diyl) receives electrochem. oxidation with Epa  
 of .apprx.0.6 V vs. Ag/AgCl with a high doping level (number of pos.  
 charges stored per the repeating unit of the polymer) of .apprx.2 in  
 aqueous H<sub>2</sub>SO<sub>4</sub> solns. The oxidized polymer exhibits an elec. conductivity of  
 0.2 S cm<sup>-1</sup> at room temperature and Arrhenius-type plots of the elec. conductivity  
 give an activation energy of .apprx.0.1 eV. The oxidized polymer  
 film gives a pos. Seebeck coefficient of .apprx.50  $\mu$ V K<sup>-1</sup>.  
 IT 31545-82-1, Bis(4-bromophenyl)amine homopolymer, sru  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (electrochem. doping and redox behavior of poly(phenylaminediyl)  
 in acidic aqueous media and electronic properties of doped polymer)  
 RN 31545-82-1 HCAPLUS  
 CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 36  
 IT 31545-82-1, Bis(4-bromophenyl)amine homopolymer, sru  
 178931-38-9, Bis(4-bromophenyl)amine homopolymer  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (electrochem. doping and redox behavior of poly(phenylaminediyl)  
 in acidic aqueous media and electronic properties of doped polymer)

REFERENCE COUNT:

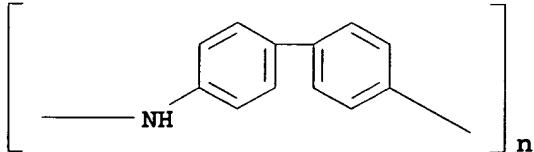
23 THERE ARE 23 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L25 ANSWER 4 OF 5 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 1998:89806 HCPLUS  
 DOCUMENT NUMBER: 128:115316  
 TITLE: Preparation of Poly(diphenylamine-4,4'-diyl) and  
 Related Random Copolymers by Organometallic  
 Polycondensation. Electrical, Electrochemical,  
 and Optical Properties  
 AUTHOR(S): Kim, Sang-Bum; Harada, Ken; Yamamoto, Takakazu  
 CORPORATE SOURCE: Research Laboratory of Resources Utilization,  
 Tokyo Institute of Technology, Yokohama, 226,  
 Japan  
 SOURCE: Macromolecules (1998), 31(4), 988-993  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Preparation and properties of poly(arylamine)s prepared by organometallic polycondensation are described. Dehalogenative polycondensation of 4,4'-dibromodiphenylamine, Br-PhNHPh-Br, with a zerovalent nickel complex affords soluble poly(diphenylamine-4,4'-diyl), P(DPA) ( $p\text{-Br-PhNHPh-Br} + n\text{Ni(0)Lm} \rightarrow P(\text{DPA})$ ), with Mn and Mw values of 6.4 + 103 and 2.0 + 104 and an  $[\eta]$  value of 0.66 dL g-1 in high yield. P(DPA) has a well-regulated structure and been characterized by IR, NMR, and UV-visible spectroscopy, as well as by cyclic voltammetry. The polymer shows a  $\pi-\pi^*$  absorption band and photoluminescence band at 379 and 417 nm, resp., in NMP. P(DPA) shows two reversible and stable redox cycles at  $E^\circ = 0.20$  and 0.60 V vs Ag/Ag+. Dehalogenative copolymer of Br-PhNHPh-Br with 3,5-dibromotoluene, TolBr2, with the zerovalent nickel complex gives random copolymers, P(DPA-ran-Tol), and they behave analogously in the electrochem. measurement. Films of P(DPA) and P(DPA-ran-Tol) exhibit electrochromism during their electrochem. oxidation, and the P(DPA) film reversibly changes its color stepwise from light brown to purple through red. P(DPA) shows elec. conductivity of 5 S cm-1 when treated with iodine.

IT 31545-82-1P, Bis(4-bromophenyl)amine homopolymer, sru  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (Poly(diphenylamine-4,4'-diyl); preparation and electrochem. and  
 optical properties of poly(diphenylamine-4,4'-diyl) and related  
 random copolymers)

RN 31545-82-1 HCPLUS  
 CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36, 73, 76

IT 31545-82-1P, Bis(4-bromophenyl)amine homopolymer, sru

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(Poly(diphenylamine-4,4'-diyl); preparation and electrochem. and optical properties of poly(diphenylamine-4,4'-diyl) and related random copolymers)

REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 5 OF 5 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1996:346247 HCPLUS

DOCUMENT NUMBER: 125:87357

TITLE: Preparation of poly(diphenylamine-4,4'-diyl) and a related polymer by organometallic polycondensation and their properties

AUTHOR(S): Yamamoto, Takakazu; Kim, Sang-Bum; Maruyama, Tsukasa

CORPORATE SOURCE: Res. Laboratory Resources Utilization, Tokyo Inst. Technol., Yokohama, 226, Japan

SOURCE: Chemistry Letters (1996), (6), 413-414  
CODEN: CMLTAG; ISSN: 0366-7022

PUBLISHER: Nippon Kagakkai

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Nickel-promoted dehalogenation polymerization of bis(4-bromophenyl)amine gives poly(diphenylamine-4,4'-diyl) with a  $[\eta]$  value of 0.66 dLg-1 in high yield. The polymer was characterized by IR, 1H-NMR and UV-visible spectroscopy and shows semicond. when treated with acids. Poly(azobenzene-4,4'-diyl) was prepared analogously.

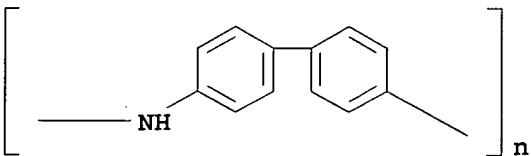
IT 31545-82-1P, Bis(4-bromophenyl)amine homopolymer, sru

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and properties of)

RN 31545-82-1 HCPLUS

CN Poly(imino[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 76

IT 31545-82-1P, Bis(4-bromophenyl)amine homopolymer, sru

178931-38-9P, Bis(4-bromophenyl)amine homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and properties of)

=> d 126 ibib abs hitstr hitind 1-50

L26 ANSWER 1 OF 50 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:417267 HCPLUS

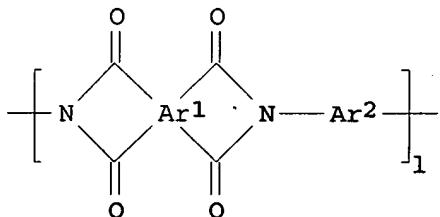
DOCUMENT NUMBER: 135:26977

TITLE: Liquid-crystal display device and resin

INVENTOR(S): composition therefor  
 Miwa, Takao; Hojo, Fusao; Okabe, Yoshiaki;  
 Yamada, Shinji; Ueno, Takumi; Satou, Toshihiro  
 Hitachi, Ltd., Japan  
 SOURCE: PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001040851	A1	20010607	WO 1999-JP6718	199911 30
<--				
W: CN, JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 1235099	A1	20020828	EP 1999-974024	199911 30
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
PRIORITY APPLN. INFO.:			WO 1999-JP6718	W
				199911 30
<--				

GI



I

AB A liquid-crystal display comprises a liquid-crystal layer between a first substrate and a second substrate, a thin-film transistor formed on the first substrate, pixel electrodes, which is formed on the liquid-crystal layer and connected to the transistor, and a flattening insulating film, which is interposed between the electrodes and the transistor and has contact holes, wherein the flattening insulating film is made of a resin having one of general structures I, X-NH-Ar2-(NH-CO-Ar1(COOH)2-COHN-Ar2)m-NH-X, (X-CO)(HOOC)Ar1[-(COOH)-(CONHAr2-NHCO)-(HOOC)-Ar1](-COX)(-COOH) (Ar1 = biphenyl, biphenyl ether, 2,2-bis(phenyl)hexafluoropropane, etc.; Ar2 = bisphenylsulfone, 2,2-bis(4-hydroxyphenyl)hexafluoropropane, etc.; l = 3-1000 integer; m, n = 2-100 integer; X = polymerizable

connecting group). The resin composition has high transparency in the visible region, is highly effective in flattening, and has resistance to resist removers. Consequently, by using the resin composition as an insulating flattening film for a liquid-crystal display, the display can have a high contrast and be reduced in image quality decrease.

IT 86588-45-6P

RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(flattening insulating film for liquid crystal display device)

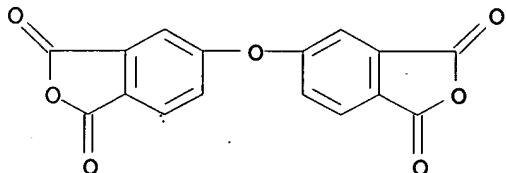
RN 86588-45-6 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with  
2,2'-dimethyl[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX NAME)

CM 1

CRN 1823-59-2

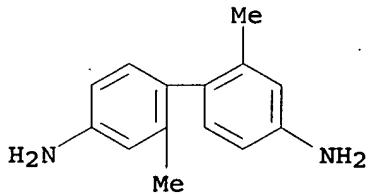
CMF C16 H6 O7



CM 2

CRN 84-67-3

CMF C14 H16 N2



IC ICM G02F001-1333

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 77238-86-9P, 3,3',4,4'-Biphenyltetracarboxylic acid dianhydride-3,3'-Diaminodiphenyl sulfone copolymer

86588-45-6P 92004-90-5P, 4,4'-Oxydiphthalic

dianhydride-3,3'-Diaminodiphenyl sulfone copolymer 106907-27-1P

121333-86-6P, 4,4'-Oxydiphthalic dianhydride-2,2-Bis(3-amino-4-

hydroxyphenyl)hexafluoropropene copolymer 122962-66-7P,

3,3',4,4'-Biphenyltetracarboxylic acid dianhydride-2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropene copolymer 122983-62-4P

127883-95-8P 172520-37-5P 230949-76-5P

RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

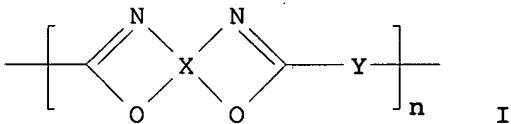
(flattening insulating film for liquid crystal display device)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 2 OF 50 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2000:631944 HCPLUS  
 DOCUMENT NUMBER: 133:223909  
 TITLE: Organic electric insulating films with  
micropores for semiconductors and their  
manufacture  
 INVENTOR(S): Murayama, Mitsumoto; Mizumoto, Yoko; Eguchi,  
Toshimasa  
 PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000248077	A	20000912	JP 1999-371775	199912 27
PRIORITY APPLN. INFO.:			JP 1998-374704	A 199812 28
<--				

GI



AB The films comprising polybenzoxazoles I (X = tetravalent organic group; Y = divalent organic group; n = 2-1000) are manufactured by mixing oligomers and corresponding I precursors (prepared from diaminodiphenols and dicarboxylic acids), forming films, cyclizing the precursors, and heating to evaporate the oligomers for micropore formation. Thus, 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane and ,4,4'-hexafluoroisopropylidenediphenyl-1,1'-dicarboxylic chloride were polymerized, mixed with Ph carbamate-terminated propylene oxide oligomer, applied on an Al-deposited Si wafer, heated, and overcoated with Al to give an electrode, showing dielectric constant 2.2, 5% weight loss temperature 513°, and micropore size 5 nm.

IT 29503-97-7P, Terephthaloyl chloride, polymer with 4,4'-diamino-3,3'-biphenyldiol

RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)  
 (manufacture of organic elec. insulating films with micropores for

semiconductors)

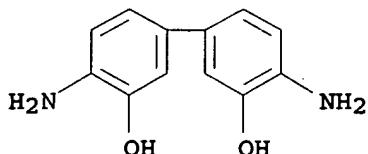
RN 29503-97-7 HCAPLUS

CN 1,4-Benzenedicarbonyl dichloride, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (CA INDEX NAME)

CM 1

CRN 2373-98-0

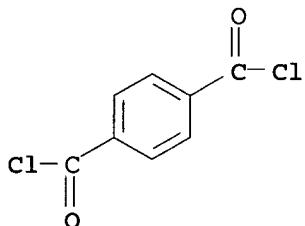
CMF C12 H12 N2 O2



CM 2

CRN 100-20-9

CMF C8 H4 Cl2 O2



IC ICM C08J005-18

ICS C08G073-22; H01L021-312; C09D005-24; C09D179-04

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

IT 26183-62-0P 29503-97-7P, Terephthaloyl chloride, polymer with 4,4'-diamino-3,3'-biphenyldiol 112480-81-6P, 2,2-Bis(3-amino-4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,2-bis(4-carbonyl chloride benzene)-1,1,1,3,3,3-hexafluoropropane copolymer, srn 112513-26-5P, 2,2-Bis(3-amino-4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane-2,2-bis(4-carbonyl chloride benzene)-1,1,1,3,3,3-hexafluoropropane copolymer 123349-57-5P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-2,2-bis(4-carboxyphenyl)hexafluoropropane copolymer

RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)

(manufacture of organic elec. insulating films with micropores for semiconductors)

L26 ANSWER 3 OF 50 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:511727 HCAPLUS

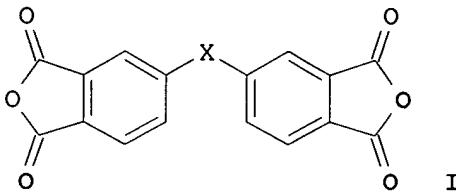
DOCUMENT NUMBER: 133:127657

TITLE: Thin-film transistor liquid crystal display device

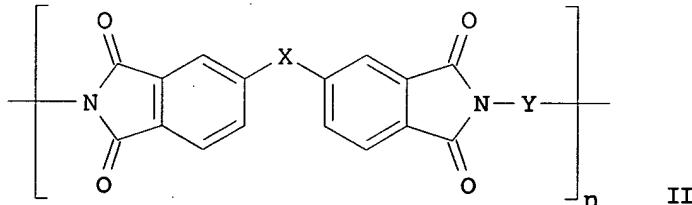
INVENTOR(S) : Sasaki, Nobuhiko; Ueda, Mitsuru  
 PATENT ASSIGNEE(S) : Alps Electric Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000206509	A	20000728	JP 1999-11214	199901 19
PRIORITY APPLN. INFO. :		<-- JP 1999-11214		199901 19
<--				

GI



I



II

AB The device has a liquid crystal layer sandwiched between a pair of substrates, one of which is coated with an interlayer insulating film comprising a fluorinated polyimide (imidation ratio 66-90%) containing a repeating unit having a formula I ( $n = 50-1000$  integer) manufactured from a fluorinated carboxylic anhydride II [ $X = C(CF_3)_2, CO_2(CF_2)_2CO_2, Si(CF_3)_2CSi(CF_3)_2$ ] and an aromatic diamine  $NH_2YNH_2$  ( $Y = Q, NH_2-Ph-p-O-Ph-p-NH_2, NH_2-Ph-p-NH_2$ ). The film shows low dielectricity, high light transmittance, and improved adhesion to an upper electrode. The device shows high aperture.

IT 129197-26-8P

RL: DEV (Device component use); IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (TFT liquid crystal display device having fluorinated polyimide-based interlayer insulating film)

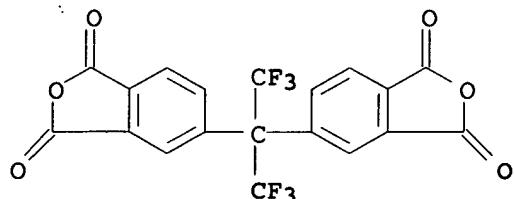
RN 129197-26-8 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 2,2'-bis(trifluoromethyl)[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX NAME)

CM 1

CRN 1107-00-2

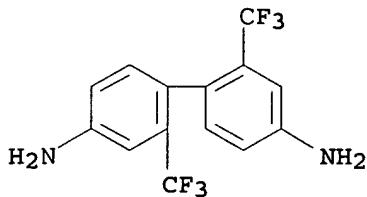
CMF C19 H6 F6 O6



CM 2

CRN 341-58-2

CMF C14 H10 F6 N2



IC ICM G02F001-1333

ICS C08G073-10; H01L021-312; H01L029-786; C09D179-08; C09J179-08

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 38, 76

IT 32240-73-6P 40921-63-9P 129197-26-8P

RL: DEV (Device component use); IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(TFT liquid crystal display device having fluorinated polyimide-based interlayer insulating film)

L26 ANSWER 4 OF 50 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:403830 HCAPLUS

DOCUMENT NUMBER: 133:24758

TITLE: Multidomain STN LCD comprising fluorinated polyimide alignment layer

INVENTOR(S): Boehm, Edgar; Osabe, Akio; Auman, Brian

PATENT ASSIGNEE(S): Merck Patent G.m.b.H., Germany

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 42 pp.

DOCUMENT TYPE: CODEN: CNXXEV

LANGUAGE: Patent

Chinese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1211743	A	19990324	CN 1998-115277	199806 25
TW 587185	B	20040511	TW 1998-87106450	199804 27
US 6067139	A	20000523	US 1998-104043	199806 25
JP 11231326	A	19990827	JP 1998-195105	199806 26
PRIORITY APPLN. INFO.:			EP 1997-110453	A 199706 26

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OTHER SOURCE(S) : MARPAT 133:24758  
GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB A multidomain STN LCD comprises a liquid crystal layer, an **electrode** on each side of the liquid crystal layer, and a fluorinated polyimide layer between the **electrode** and the liquid crystal layer for aligning the liquid crystal layer. The fluorinated polyimide layer is prepared from aromatic diamines represented by the formulas I and II (R1 = C1-16 fluorinated alkyl; L = H or Me; R2 = H, CF<sub>3</sub>, or OCF<sub>3</sub>; R3 = NH<sub>2</sub> or p-OC<sub>6</sub>H<sub>4</sub>NH<sub>2</sub>; and Q<sub>1</sub> = O, C(CF<sub>3</sub>)<sub>2</sub>, or p-OC<sub>6</sub>H<sub>4</sub>O) and aromatic tetracarboxylic dianhydrides represented by the formulas III-V (R4 = H or Me; R5 = H, CF<sub>3</sub>, or OCF<sub>3</sub>; Q<sub>2</sub> = a single bond or C(CF<sub>3</sub>)<sub>2</sub> such that when R5 = H, Q<sub>2</sub> = C(CF<sub>3</sub>)<sub>2</sub>; and R6 = CF<sub>3</sub> or Ph). The liquid crystal layer comprises at least one compound represented by the formula VI (R7 = C1-12 alkyl such that one or two nonadjacent CH<sub>2</sub> groups may be substituted by O, CO, CO<sub>2</sub>, OCO, or CH=CH; A<sub>1</sub>, A<sub>2</sub> = trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, 3,5-difluoro-1,4-phenylene, pyrimidine-2,5-diyl, pyridine-2,5-diyl, or trans-diphosphoranylalkane-2,5-diyl; Z<sub>1</sub>, Z<sub>2</sub> = a single bond, CH<sub>2</sub>CH<sub>2</sub>, CO<sub>2</sub>, OCO, CH=CH, or C.tplbond.C; X<sub>1-3</sub> = H or F; R<sub>8</sub> = R<sub>7</sub> or QY; Q = CF<sub>2</sub>, OCF<sub>2</sub>, or C<sub>2</sub>H<sub>4</sub>; Y = H, F, Cl, or CN; and n = 0-2). The fluorinated compound components in the polyimide layer is >5 mol%.

IT 178094-77-4P 188180-08-7P 188180-10-1P  
 RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (synthesis and use in preparing polyimide alignment layers for

multidomain STN LCDs)

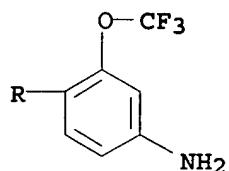
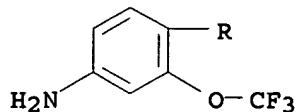
RN 178094-77-4 HCPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
2,2'-bis(trifluoromethoxy) [1,1'-biphenyl]-4,4'-diamine and  
4,4'-oxybis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 147835-68-5

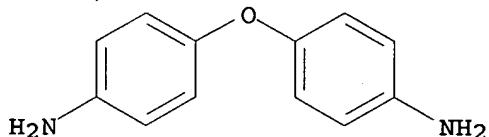
CMF C14 H10 F6 N2 O2



CM 2

CRN 101-80-4

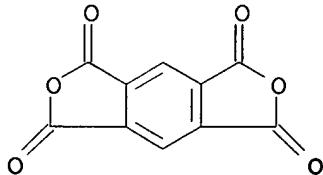
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6

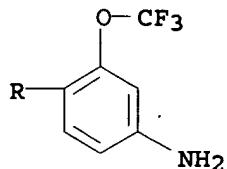
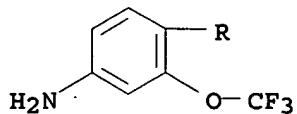


RN 188180-08-7 HCPLUS

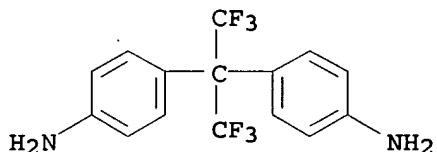
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
2,2'-bis(trifluoromethoxy) [1,1'-biphenyl]-4,4'-diamine and  
4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis[benzenamine]

(9CI) (CA INDEX NAME)

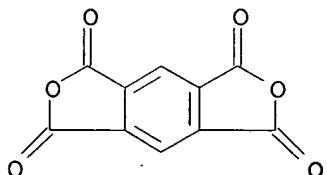
CM 1

CRN 147835-68-5  
CMF C14 H10 F6 N2 O2

CM 2

CRN 1095-78-9  
CMF C15 H12 F6 N2

CM 3

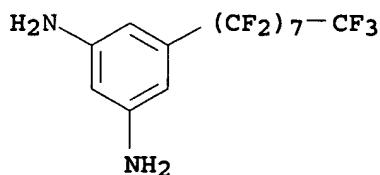
CRN 89-32-7  
CMF C10 H2 O6

RN 188180-10-1 HCPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
2,2'-bis(trifluoromethoxy) [1,1'-biphenyl]-4,4'-diamine and  
5-(heptadecafluoroctyl)-1,3-benzenediamine (9CI) (CA INDEX NAME)

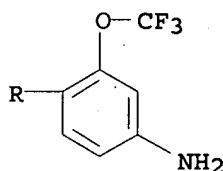
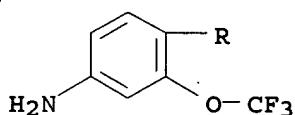
CM 1

CRN 167862-02-4  
CMF C14 H7 F17 N2



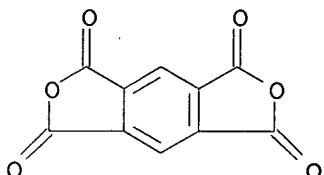
CM 2

**CRN** 147835-68-5  
**CMF** C14 H10 F6 N2 O2



CM 3

CRN 89-32-7  
CMF C10 H2 06



TC TCM G02E001-00

IC ICM 0021001 00  
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 36250-32-5P 36289-84-6P 84769-07-3P 84789-95-7P 94504-72-0P  
94525-06-1P 178094-77-4P 188180-08-7P

188180-10-1P  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); TSPN (—)

**reparation); USES (Uses)**  
(synthesis and use in preparing polyimide alignment layers for  
multidomain STN LCDs)

L26 ANSWER 5 OF 50 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2000:81263 HCPLUS  
 DOCUMENT NUMBER: 132:201558  
 TITLE: Evaluation of copper penetration in low- $\kappa$   
 polymer dielectrics by bias-temperature stress  
 Loke, Alvin L. S.; Wong, S. Simon; Talwalkar,  
 Niranjan A.; Wetzel, Jeffrey T.; Townsend, Paul  
 H.; Tanabe, Tsuneaki; Vrtis, Raymond N.;  
 Zussman, Melvin P.; Kumar, Devendra  
 CORPORATE SOURCE: Center for Integrated Systems, Stanford  
 University, Stanford, CA, 94305, USA  
 SOURCE: Materials Research Society Symposium Proceedings  
 (1999), 565(Low-Dielectric Constant  
 Materials V), 173-187  
 CODEN: MRSPDH; ISSN: 0272-9172  
 PUBLISHER: Materials Research Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB The industry is strongly interested in integrating low- $\kappa$  dielecs. with Damascene copper. Otherwise, with conventional materials, interconnects cannot continue to scale without limiting circuit performance. Integration of copper wiring with silicon dioxide (oxide) requires barrier encapsulation since copper drifts readily in oxide. An important aspect of integrating copper wiring with low- $\kappa$  dielecs. is the drift behavior of copper ions in these dielecs., which will directly impact the barrier requirements and hence integration complexity. This work evaluates and compares the copper drift properties in six low- $\kappa$  organic polymer dielecs.: parylene-F; benzocyclobutene; fluorinated polyimide; an aromatic hydrocarbon; and two varieties of poly(arylene ether). Copper/oxide/polymer/oxide/silicon capacitors are subjected to bias-temperature stress to accelerate penetration of copper from the gate electrode into the polymer. The oxide-sandwiched dielec. stack is used to overcome interface instabilities occurring when a low- $\kappa$  dielec. is in direct contact with either the gate metal or silicon substrate. The copper drift rates in the various polymers are estimated by elec. techniques, including capacitance-voltage, current-voltage, and current-time measurements. Results correlate well with time-to-breakdown obtained by stressing the capacitor dielecs. Our study shows that copper ions drift readily into fluorinated polyimide and poly(arylene ether), more slowly into parylene-F, and even more slowly into benzocyclobutene. A qual. comparison of the chemical structures of the polymers suggests that copper drift in these polymers may possibly be retarded by increased crosslinking and enhanced by polarity in the polymer.

IT 181997-50-2, FPI-136M

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (evaluation of copper penetration in low- $\kappa$  polymer dielecs.  
 by bias-temperature stress)

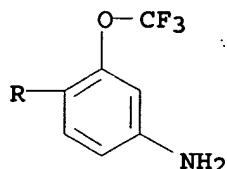
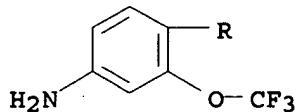
RN 181997-50-2 HCPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 1,4-benzenediamine, 2,2'-bis(trifluoromethoxy)[1,1'-biphenyl]-4,4'-diamine and 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

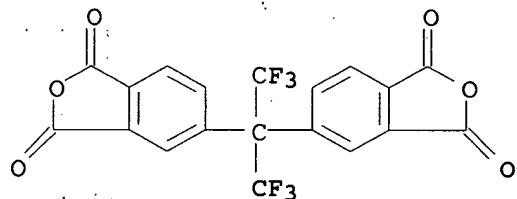
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CRN 147835-68-5

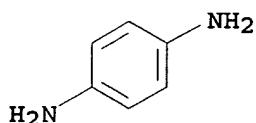
CMF C14 H10 F6 N2 O2



CM 2

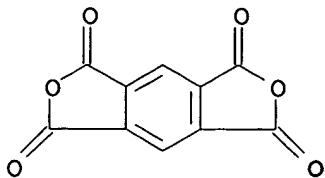
CRN 1107-00-2  
CMF C19 H6 F6 O6

CM 3

CRN 106-50-3  
CMF C6 H8 N2

CM 4

CRN 89-32-7  
CMF C10 H2 O6



CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

IT 7440-50-8, Copper, processes 25669-37-8, Parylene-F  
181997-50-2, FPI-136M 197923-27-6, PAE-2 203945-07-7,  
SiLK 259810-75-8, Alcap ERL: DEV (Device component use); PEP (Physical, engineering  
or chemical process); PROC (Process); USES (Uses)  
(evaluation of copper penetration in low-k polymer dielectrics.  
by bias-temperature stress)REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 6 OF 50 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:771140 HCAPLUS

DOCUMENT NUMBER: 132:93850

TITLE: Metal-Metal Interactions in a Novel Hybrid  
Metallocopolymer

AUTHOR(S): Cameron, Colin G.; Pickup, Peter G.

CORPORATE SOURCE: Department of Chemistry, Memorial University of  
Newfoundland, St. John's, NF, A1B 3X7, Can.

SOURCE: Journal of the American Chemical Society (1999), 121(50), 11773-11779

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A conjugated polymer-redox polymer hybrid based on the complexation of poly[2-(2-pyridyl)bibenzimidazole] with bis(2,2'-bipyridyl)Ru<sup>2+</sup> was prepared to take advantage of electronic communication between metal centers through the conjugated backbone. The existence of such communication was confirmed by the observation of an intervalence charge-transfer band in the near-IR spectrum of the Ru(III/II) mixed valence state. Electron transport studies by rotating disk voltammetry, dual (sandwich) electrode voltammetry, and impedance spectroscopy yielded electron diffusion coeffs., (De), of >10<sup>-8</sup> cm<sup>2</sup>/s for the Ru(III/II) mixed valence state. De in nonconjugated Ru(2,2'-bipyridyl)33+/2+-type polymers was typically less than this by at least a factor of 10, indicating that electron transport in the new polymer was enhanced by communication of metal centers through the backbone. The redox potential of the Ru sites and De can be manipulated by changing the electron d. on the polymer backbone via pH control of the degree of protonation of the imidazole moieties.

IT 56411-22-4DP, 2,5-Pyridinedicarboxylic acid, polymer with [1,1'-biphenyl]-3,3',4,4'-tetramine, bis(bipyridyl)ruthenium complexes, dichlorate complexes

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(metal-metal interactions and electronic properties of conjugated polymer-redox ruthenium-polybenzimidazole complexes)